TSSG/RED/ATB-053-70
17 March 1970

MEMORANDUM FOR: Chief, Advanced Technology Branch, RED, TSSG

SUBJECT : Installation of Input/Output Equipment for Digital Image Manipulation (DIM) Program

REFERENCE : Memo, TSSG/RED/ATB-EL-74/69, dtd 16 Sept 69

1. PROBLEM:

The final dimensions and configuration of the input/output (I/O) equipment being funded by ORD/DD/S&T and NPIC are now known; operational considerations suggest that the equipment should not be located in the clean room area originally allocated.

2. FACTS BEARING ON THE PROBLEM:

a. Current plans indicate that the Digital Image Manipulation (DIM) I/O System will be delivered to NPIC by [redacted] @ 1 June 1970 and installed in clean room 4N806A (see attachment 1). 25X1

b. Image analysis equipment presently located in room 4N806A also requires a clean room environment. If the DIM I/O System is installed in 4N806A as is presently planned, some of the equipment presently located therein will have to be transferred elsewhere.

c. The requirement for a "false" floor (see Reference) in room 4N806A no longer exists.

d. Recommendations for modifying room 4N806A to accommodate all the equipment have been received (see attachment 2).

e. No modification schedule has been established. Physical plant alterations must begin by 25 March 1970 to meet current schedule.

f. The input device is the only component of the system which must operate in a clean room environment.

g. Personnel admitted to the clean room area should be kept at a minimum to obtain optimum results from this system. This includes tours and maintenance.

SECRET

h. A clean room environment is essential for the scanner input components of the subject equipment and for subsequent versions in the foreseeable future.

i. A portable plastic laminar flow clean room (the baggie) was originally purchased for the DIM I/O System by ORD at a cost of [redacted] and is still available. The outer frame of this unit measures 13'7$\frac{1}{4}$" x 12'5$\frac{1}{4}$" with a working area of 11'0" x 11'9". Only the baggie unit would be required if installed at NPIC. 25X1

j. Installation of the baggie in a room with a false ceiling could be accomplished quicker and cheaper than if it were installed in a room with a plaster ceiling.

k. The DIM I/O System would be subject to less vibration if located away from building 213A which houses two large air compressors. Rooms 4N806C and 4N807 are adjacent to this building.

l. A laminar flow clean room (the best type) with adequate additional space for the DIM I/O System is in operation in APSD/TSSG. This area is presently intended for this equipment after completion of the development and testing phase to be performed by the ITL.

3. DISCUSSION:

a. The "false" floor was proposed for room 4N806A to protect cables joining different components of the system. A re-evaluation of this requirement indicates:

(1) Existing cabinets in the room would have to be modified if a "false" floor were installed. The height (5" minimum) of such a floor would restrict opening the bottom doors. If this floor were laid so as to not block these doors, it would have to be curtailed by means of a ramp or a sharp dropoff. Neither the ramp nor the dropoff offers desirable or safe working conditions.

(2) The double doors between clean rooms 4N806A and 4N806B open into 4N806A. It is estimated that the cost to reverse the opening of these doors is @ $600 and @ $200 to remove the existing doors in favor of a "curtain" door. Likewise, the door between 4N806A and the clean room vestibule opens into 4N806A. "False" floor allowances for these doors do not offer optimum working conditions.

(3) Cables leading from the input device could be covered with an appropriate protective shield or routed overhead.

(4) The current price of "false" floor tiles is @ $8 per square foot. A savings of @ $2,000 would be realized by foregoing this type of floor in room 4N806A.

b. The major advantage for installing the complete DIM I/O System in one room is easy accessibility to all components for operation as designed. The input device (an optical/mechanical film scanner) and the output system (a video monitor and a hard copy monitor) are dependent on the close proximity of peripheral equipment (a 9-track Kennedy magnetic tape transport, a Honeywell DDP-416 computer and an ASR-33 teletype) for efficient operation.

c. Alternatives:

(1) Install the entire system in clean room 4N806A. Analysis: This would provide a clean room working environment with the complete system in one room. Extensive electrical, mechanical, and architectural changes would be necessary, and space required for optical laboratory equipment would have to be found. Also, severe traffic restrictions will be necessary to keep the area clean enough.

(2) Locate the complete system in clean room 4N806C. Analysis: This approach has the same advantages and disadvantages as alternative (1), with the further problem of moving to and remounting in 4N806A the eight foot long Beck bench and the granite slabs now in 4N806C. However this configuration would permit an observation window through the adjoining wall.

(3) Place the input device in a clean room and the remaining equipment in an adjoining room. Analysis: The clean room environment would be where it is essential, the output system observation would be more convenient, and equipment space limitations overcome. This would, however, create a functionally inefficient work flow when operating the input device, and is not recommended by the designer or future operators. In addition, room modifications required in two rooms instead of one, and the space required for a second room is not readily available on the same floor.

(4) Locate the DIM I/O System inside the portable clean room (the baggie) in room 4N807 (see attachment 3) or 4N808. Analysis: The complete system would be in one working area. The portable clean room offers a cleaner working atmosphere than the now existing ITL clean rooms. The baggie provides a good location for system observation and maintenance. This would allow the 4N806 clean room area to be used as an optics lab as originally planned, with no modifications necessary to existing clean rooms. Use of the baggie would require a "false" floor in the room selected; and relocation of existing equipment to some as yet unavailable space. Room 4N808 has a portable ceiling while 4N807 has a plaster ceiling. Room 4N808 has a fuse box located on one wall with 100 amps currently not in service which could be used for operation of the DIM I/O System if located there.

(5) Place the entire system in APSD's clean room. Analysis: All system components would be in one clean room working area as originally intended. Floor modifications may not be required, though some electrical cable and air conditioning changes would be necessary. An observation window would have to be installed. In informal discussions with the Ch/APSD and D/Ch/APSD, they indicated new equipment was scheduled for the clean room in the future and space allowance could not be made for the DIM I/O System. In discussions with [redacted] he indicated that the input device would have to be installed in the same section of the APSD clean room as the Mann Data Microdensitometer to obtain optimum results. Such a configuration is impractical for normal working operations. 25X1 25X1

(6) Install the DIM I/O System inside the baggie in the area on the second floor formerly occupied by Messrs. [redacted] (see attachment 4). Analysis: The input, output, and peripheral equipment would be enclosed in a clean room working environment. This alternative offers a suitable location for system observation and maintenance. A "false" floor would be required to minimize vibrations and isolate the cables. If necessary, the existing false ceiling in this area could be removed to accommodate the baggie. One inconvenience with this alternative is that the equipment would be located external to the ITL/ATB area. 25X1 25X1

4. CONCLUSIONS:

a. Room 4N808 is the best location.

b. Installation of the DIM I/O System and the baggie unit in the vacant area on second floor (2N430) is a reasonable solution.

c. Room 4N807 is the least acceptable alternative.

d. The APSD clean room should be eliminated from consideration.

e. The installation of the complete DIM I/O System in either clean room, 4N806A or 4N806C, should be eliminated from consideration.

f. Location of some components in separate rooms is inefficient, operationally inconvenient and should not be adopted.

5. RECOMMENDATIONS:

In order of preference:

a. Install the equipment in room 4N808.

b. Use the baggie and the space on the second floor.

c. Install equipment in 4N807 (shop) and double up personnel in offices to accommodate space loss.

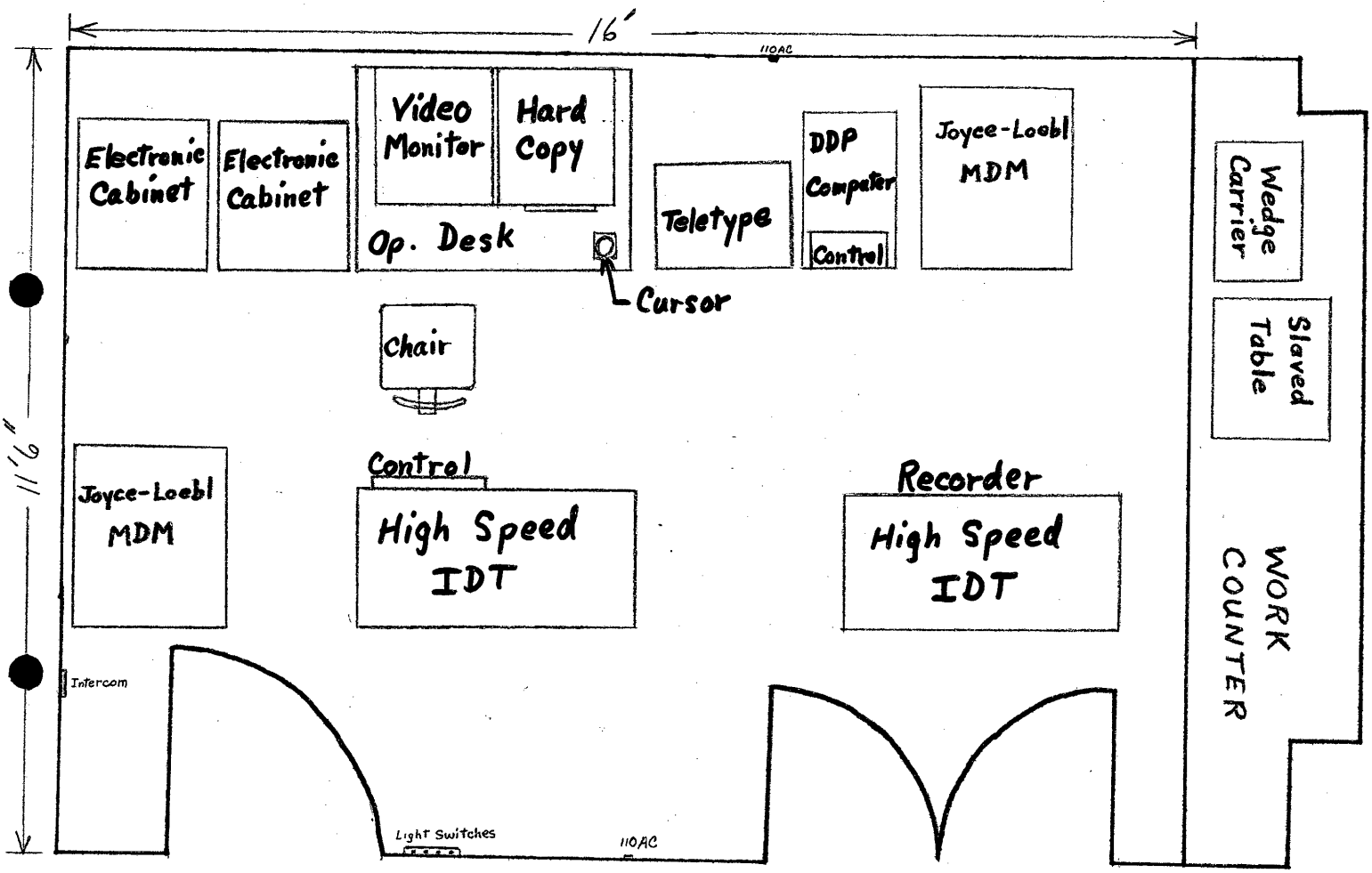
25X1

TSSG/RED/ATB/ITL

Attachments: As stated

Distribution:
Original - Addressee
2 - RED/ATB
1 - O/ORD/DD/S&T ( )

25X1



Attachment 1

Scale 3/4"

— new equipment
= existing "

ATTACHMENT #2

PRELIMINARY INVESTIGATION

Room 4N806A

ARCHITECTURAL — The existing ceiling will have to be cut and patched to accommodate the new mechanical and electrical system components.

ELECTRICAL — The new equipment requires a new 100 amp., 120 volt panel. This will be run from a new circuit breaker attached in the electric closet on the north riser on the fourth floor, and extended over the ceiling to a new panel in the room. There will also be a new 3 KW heater in the mechanical system modifications.

MECHANICAL — The room is presently air conditioned from a double duct, high velocity mixing box supplying approximately 200 cfm to the room thru a 24x24 perforated diffuser thru an absolute filter. The air leaves the space thru a lightproof louver in the door. Access to the mixing box is thru a door in the plaster ceiling. The mixing box is at the end of the branch line serving the area.

The new equipment to be located in the space will increase the air conditioning requirements far beyond the capacity of the existing mixing box or the branch ducts in the vicinity. There is a 12" diameter cold branch duct running above the ceiling of the space that serves only the air shower. The proposed scheme for properly cooling and filtering the air to the space is as follows:

(1) Remove the existing mixing box and associated ductwork and controls including space thermostat.
(2) Install new 1000 cfm variable volume box with 3KW electric reheat coil. Connect inlet to existing 12" diameter cold duct.
(3) Box shall discharge thru flexible duct, plenum, absolute filter, and 24x24 curved adjustable blade ceiling grille to space.
(4) Room temperature shall be controlled by a sensing element located in the center of the supply grille and a controller mounted on the mixing box.
(5) Relief of air from space shall be by means of a transfer duct to exit corridor outside of air shower.

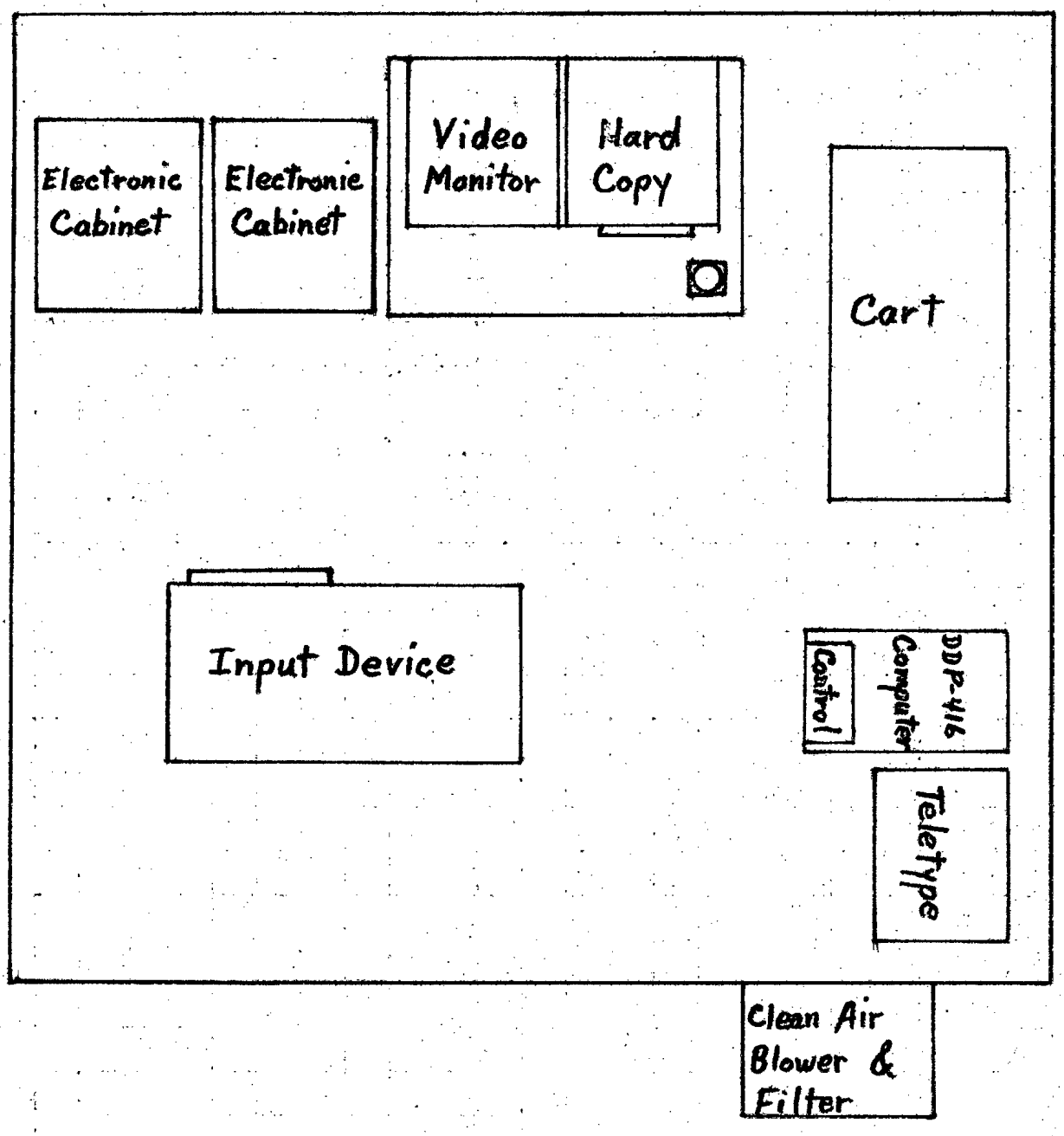
The installation of the new variable volume box will require partial removal and replacement of the plaster ceiling.

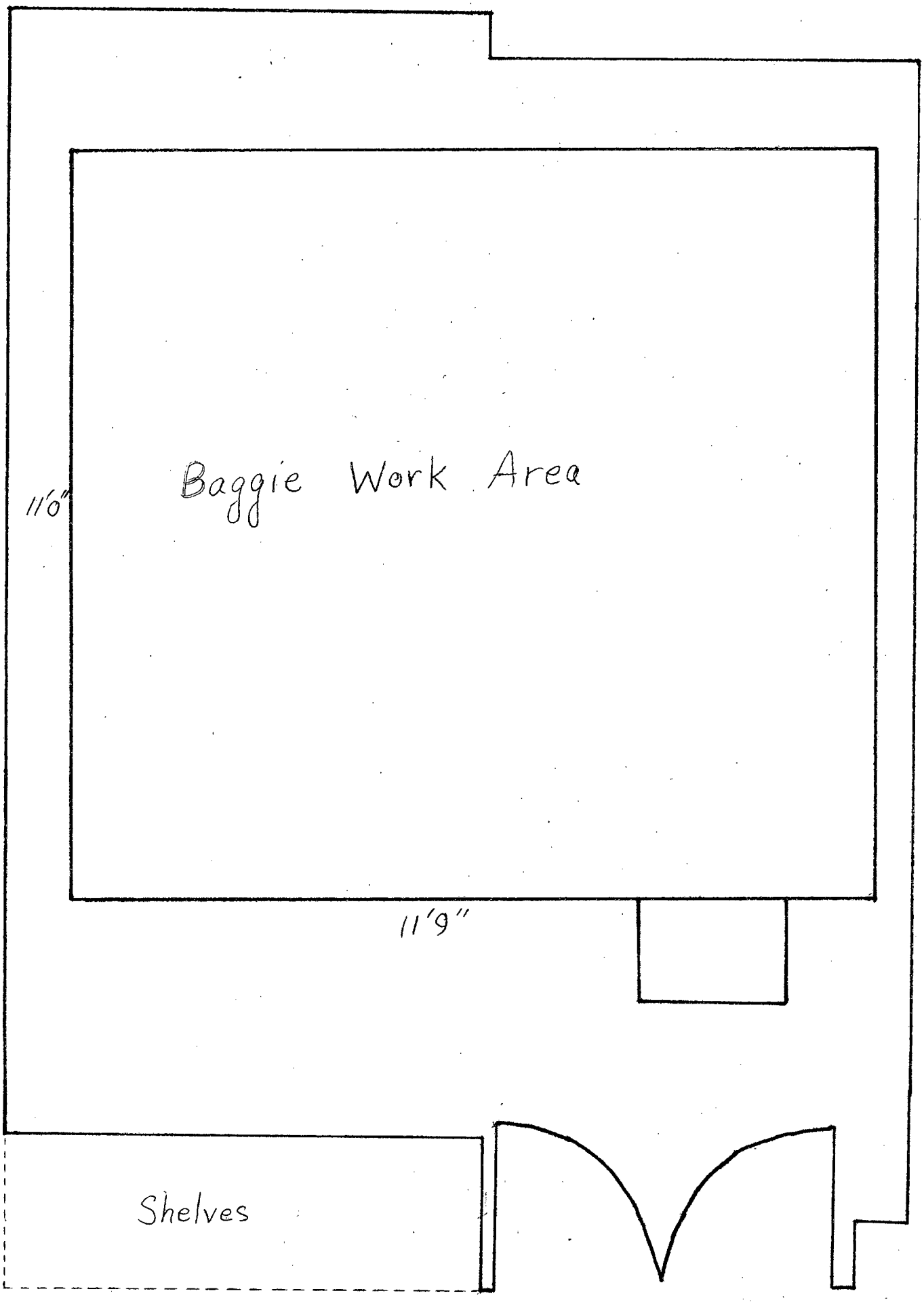
COST ESTIMATE

Electrical [ ] Mechanical [ ] Architectural [ ] 25X1

TOTAL = [ ] 25X1

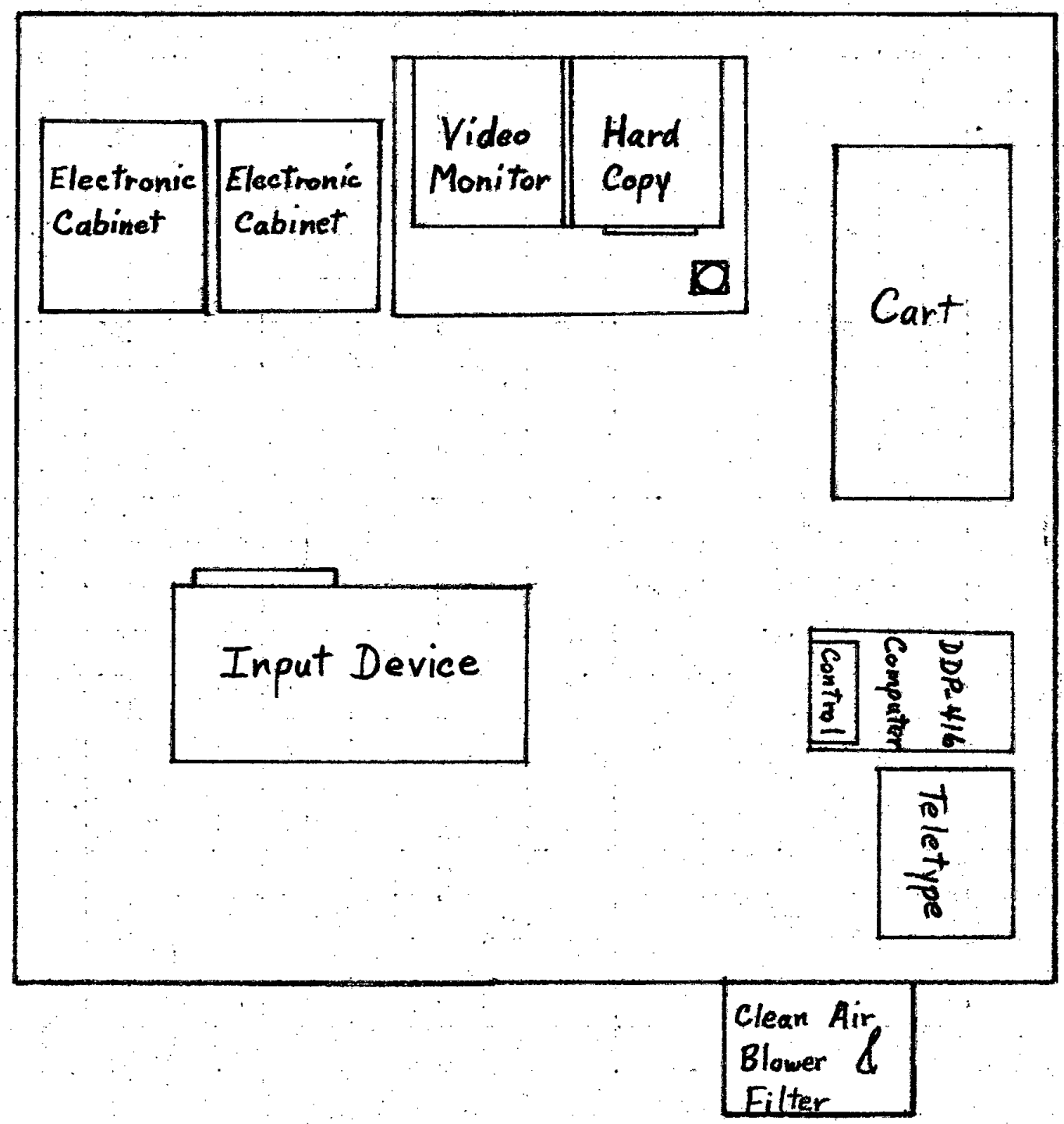
CHKD. BY____ DATE____ JOB NO.____

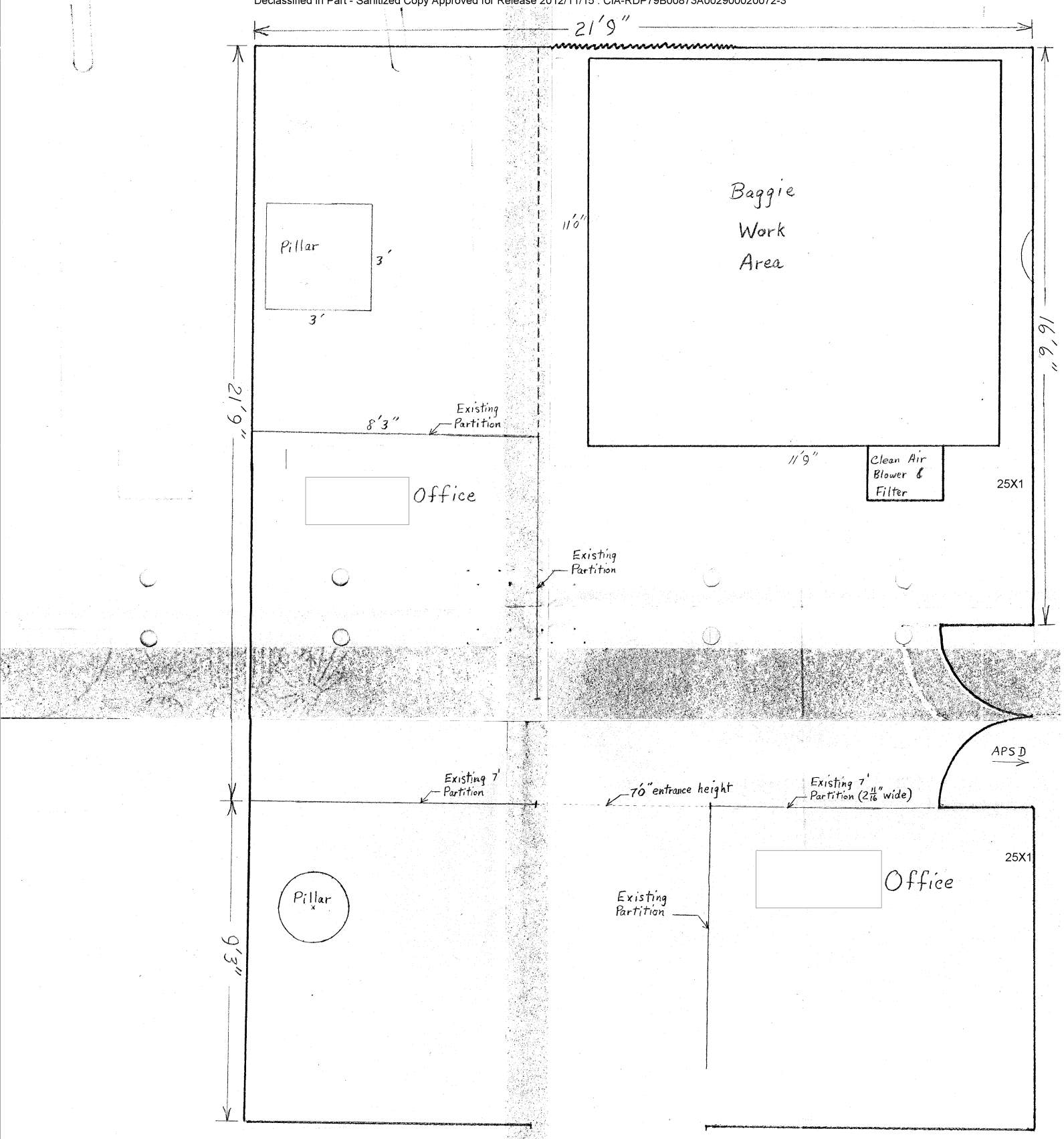




ROOM 4N807 - Attachment 3

BY D.P.R. DATE 3/16/70
CHKD. BY _____ DATE _____
SUBJECT DIM I/O System
SHEET NO. _____ OF _____
JOB NO. _____





Rooms 2N430
Scale 24:1

Attachment 4